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(54) Coated parts

(57) Parts inexpensively coated that yet are difficult to mar. The reel body 1 of a double bearing reel is given as an example of a part superficially coated in accordance with the invention. It includes a metallic base portion 10, an oxide film layer 11, a substrate paint film layer 12, and a finishing paint film layer 13. The finishing paint film layer 13 is formed by the application of a self-mending paint material. Forming the paint film layer on the surface of the reel body 1 by applying a self-mending paint material by the self-mending function of the paint material thus restores scratched portions if the surface is damaged due to scratching or the like. Therefore, scratches due to injuries tend not to remain on the coated part and as a result, scratches are unlikely to damage the surface of the body of the part. Moreover, forming the layer by applying a paint material facilitates low cost production.

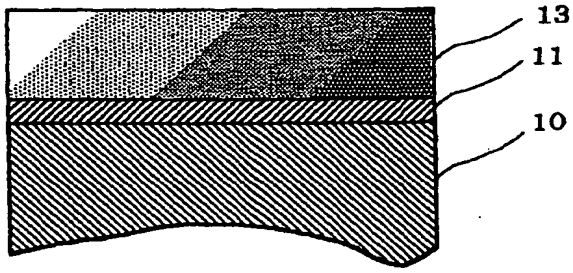

Fig. 4

EP 1 059 123 A2

[0013] In a fourth aspect of the present invention the coated part is as set forth in the foregoing aspects, but further wherein the coating layer is translucent, and a substrate paint film layer, formed by applying a colored paint, is present between the part body and the coating layer. Herein, since the coating layer is translucent, designs or letters on the substrate paint film layer formed by applying a colored paint may be seen through the coating layer. Protecting the substrate paint film layer with a coating layer that is not easily marred also maintains the appearance of the substrate paint film layer.

[0014] In a fifth aspect the coated part is as set forth in the foregoing aspects, but further wherein the part body is used for fishing equipment. In this case, the coating layer on fishing equipment often used outdoors in a corrosive atmosphere is unlikely to be damaged, maintaining the appearance of the fishing equipment. This also keeps the part body from being exposed directly to corrosive atmospheres, and hence the part body is unlikely to become corroded.

[0015] The coated part of the invention in a third aspect is as set forth in the foregoing aspects, but further wherein the part body is used in bicycles. Herein, the coating layer on bicycle parts that are frequently used outdoors is not likely to become damaged, which helps to maintain the appearance of the bicycles. This also keeps the parts from being exposed directly to the open air, and hence, the parts are unlikely to become corroded.

[0016] In a seventh aspect the coated part is as set forth in the foregoing aspects, but further wherein the part body is made of metal. In this case, if a coated part having a metallic part body is used in a corrosive atmosphere, it is not likely to corrode since the part body is covered by a coating layer that is not easily damaged.

[0017] The coated part of the invention in an eighth aspect is in accordance with the seventh aspect, but further wherein the part body is made of an aluminum alloy or a magnesium alloy, and an anodic oxidized film layer is present between the body of the part and the coating layer. Herein, since the part body made of an aluminum or magnesium alloy, which tend to corrode, is covered by the coating layer via the anodic oxidized film layer, the adherence of the coating layer as well as the anti-corrosion properties of the part are increased.

[0018] In a ninth aspect the coated part is as set forth in the foregoing aspects, but further wherein the part body is made of a synthetic resin. In this case, since the part body is made of a synthetic resin, which is not as hard as metal and thus fragile, is covered by the coating layer formed by a self-mending paint material, the synthetic resin body of the part is not likely to be damaged.

[0019] The coated part of the invention in an tenth aspect is in accordance with the ninth aspect, but further wherein the body of the part is a fiber-reinforced synthetic resin laminate article wherein a synthetic resin base material is impregnated into a high-strength fiber backing. Herein, even in fiber-reinforced synthetic resin laminate articles in which water tends to cause peeling, because the coating layer is not likely to become damaged and hence water is not likely to get into the body of the part, peeling is unlikely.

[0020] From the following detailed description in conjunction with the accompanying drawings, the foregoing and other objects, features, aspects and advantages of the present invention will become readily apparent to those skilled in the art.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021]

Fig. 1 is an oblique view of a dual-bearing reel to which an embodiment of the present invention is adopted;
Fig. 2 is sectional plan view of the dual-bearing reel of Fig. 1;
Fig. 3 is an enlarged fragmentary schematic view in section through a general part body in fishing equipment or bicycle components;
Fig. 4 is an enlarged fragmentary schematic view in section through another general part body in fishing equipment or bicycle components;
Fig. 5A and 5B are views corresponding to Fig. 3, depicting progress of mending in a self-mending paint;
Fig. 6 is side view of a spinning reel to which a second embodiment is adopted;
Fig. 7A and 7B are lateral views respectively depicting extended and collapsed states of the base portion of a fishing rod to which a third embodiment is adopted;
Fig. 8 is an enlarged fragmentary schematic view in section through the center-axial tube of the rod depicted in Fig. 7A and 7B;
Fig. 9 is cross-sectional view through a crank assembly for a bicycle according to a fourth embodiment;
Fig. 10 is a front view of the right crank arm of the Fig. 9 crank assembly.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Embodiment 1

[0022] A double bearing reel shown in FIGS. 1 and 2, to which an embodiment of the present invention is applied, is a low-profile type reel for bait cast. The double bearing reel includes a reel body 1 made of a magnesium alloy, a handle assembly 2, and a spool 4 for winding a fishing line. The handle assembly 2 is provided for rotating the spool 4 and is disposed at one side of the reel body 1. The spool 4 is rotatably provided in

porting member 40. Also, a second bail supporting member 42 is movably attached to the inner periphery side of the end of the second rotor arm 32. A bail 43 is provided between the line roller 41 located at the end of the first bail supporting member 42 and the second bail supporting member 42. A bail arm 44 for guiding the fishing line to the spool 24 is constituted by the bail supporting members 40 and 42, the line roller 41, and the bail 43. Since the rotor 23 is easily damaged when the fishing rod is placed on, and made contact with, a rock or a hard ground such as a quay, a oxide film layer 11 and a finishing coating layer 13 are formed on a base portion 10 made of an aluminum alloy in that order as shown in FIG. 4. By adopting such structure, a scratch tends not to be formed on the rotor 23.

Embodiment 3

[0035] Although fishing reels are used as examples of fishing equipment in the above-mentioned two embodiments, the present invention may also be applied to a fishing rod shown in FIG. 7.

[0036] This fishing rod includes a base rod 50 and at least one rod member 51 which is connected to the base rod 50 in a telescopic manner or in a separate segment manner, and it is possible to change the length of the base rod 50. The base rod 50 and the rod member 51 are made of, for instance, a cylindrically tapered resin laminating mold member which is obtained by winding a prepreg made of a reinforced fiber resin whose carbon fiber has been immersed in epoxy resin, around a tapered rod shape mandrel .

[0037] The base rod 50 includes a rod base portion 60 used for operating the fishing rod or attaching a reel, and a movable rod end portion 61 which may be inserted in the rod base portion 60. The movable rod end portion 61 is attached to the rod base portion 60 to be turnable circumferentially. The required rod members 51 are connected to a front end of the rod base portion 60.

[0038] A guide tube 62 is disposed at the front end of the rod base portion 60. The movable rod end portion 61 includes a center-axial tube 63 and a protruded pipe 65 which is fitted and fixed to the outer periphery of the end of the center-axial tube 63. The center-axial tube 63 of the movable rod end portion 61 is movably inserted in the cylindrical rod base portion 60 between an extended state as shown in FIG. 7A and a shortened state as shown in FIG. 7B.

[0039] Since the center-axial tube 63 of the movable rod end portion 61 is inserted in the rod base portion 60, it slides against the inner surface of the rod base portion 60. Hence, scratches easily mar its appearance. Accordingly, as shown in FIG. 8, a substrate paint film layer 12 and a finishing coating layer 13 are formed, in that order, on a base portion 10 of the center-axial tube 63 made of carbon fiber reinforced resin. Note that it is possible to form these layers 12 and 13 on the entire surface of the fishing rod including the center-axial tube 63. According to the embodiment 3, a scratch is not easily formed on the center-axial tube 63 when the center-axial tube 63 is moved in and out of the rod base portion 60 and, hence, the beauty thereof may be maintained. Also, if a scratch is formed on the center-axial tube 63, its sliding state is not easily changed since the finishing coating layer 13 is reproduced. For this reason, the engagement state thereof with the base portion 60 tends not be tighten nor loosen. Moreover, since it becomes difficult for foreign substances such as water to invade the resin portion, the laminated layer tends not to be peeled off.

Embodiment 4

[0040] A crank assembly 70 for a bicycle shown in FIG. 9 includes a right crank arm 72 and a left crank arm 73 which is non-rotatably fixed to the respective end of a crank shaft 75 made of, for instance, an aluminum alloy. The crank shaft 75 is rotatably supported by a bottom bracket 71 which is attached to a bicycle frame (not shown in the figure).

[0041] As shown in FIG. 10, the right crank arm 72 includes a boss portion 80 which is coupled to the crank shaft 75, a crank portion 81 extending outwardly in a radius direction from the boss portion 80, and five connecting fingers 82 extending outwardly in the radius direction from the boss portion 80. The coupling fingers 82 are provided with a substantially equal interval between each other and the crank portion 81 extends in the radius direction from between the two coupling fingers 82. A sprocket 83 is attached to the respective coupling finger 82 in a detachable manner by a bolt.

[0042] The right crank arm 72 is made of a magnesium alloy. A pedal shaft 92 made of a stainless alloy for attaching a pedal 90 is disposed at an end of the crank portion 81. For this attachment, a screw hole 85 is formed at the end of the crank portion 81. The screw hole 85 is formed in a sleeve 86 made of an aluminum alloy which is press fitted in the end of the crank portion 81 in a non-rotatable manner.

[0043] An adhesive is applied to a space between the sleeve 86 and the end of the crank portion 81. Also, an oxide film layer 11 and a finishing coating layer 13 as shown in FIG. 4 are formed on a base portion 10, made of an magnesium alloy, of the right crank arm 72. For this reason, a scratch is hardly formed on the right crank arm 72.

[0044] As shown in FIG. 9, the left crank arm 73 includes a boss portion 87 and a crank portion 88 extending in the radius direction from the boss portion 87. A sleeve 86 made of an aluminum alloy is also press fitted in the end of the crank portion 88, and an oxide film layer 11 and a finishing coating layer 13 as shown in FIG. 4 are formed on a base portion 10 which is made of an magnesium alloy.

[0045] In this kind of coated parts for bicycles, also,

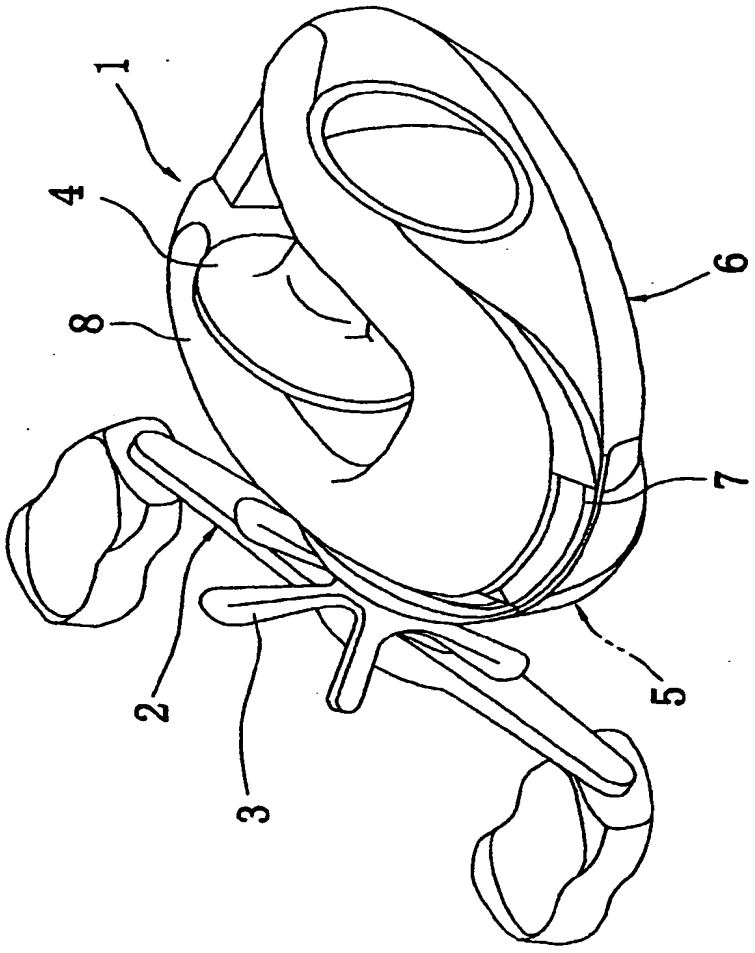

Fig. 1

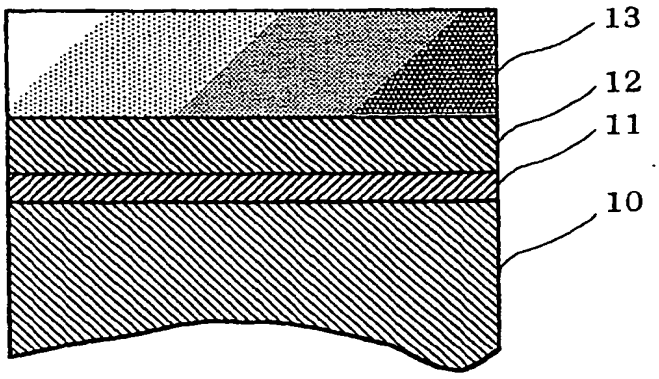

Fig. 3

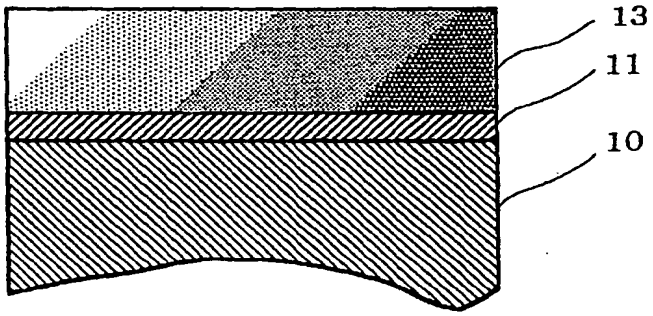

Fig. 4

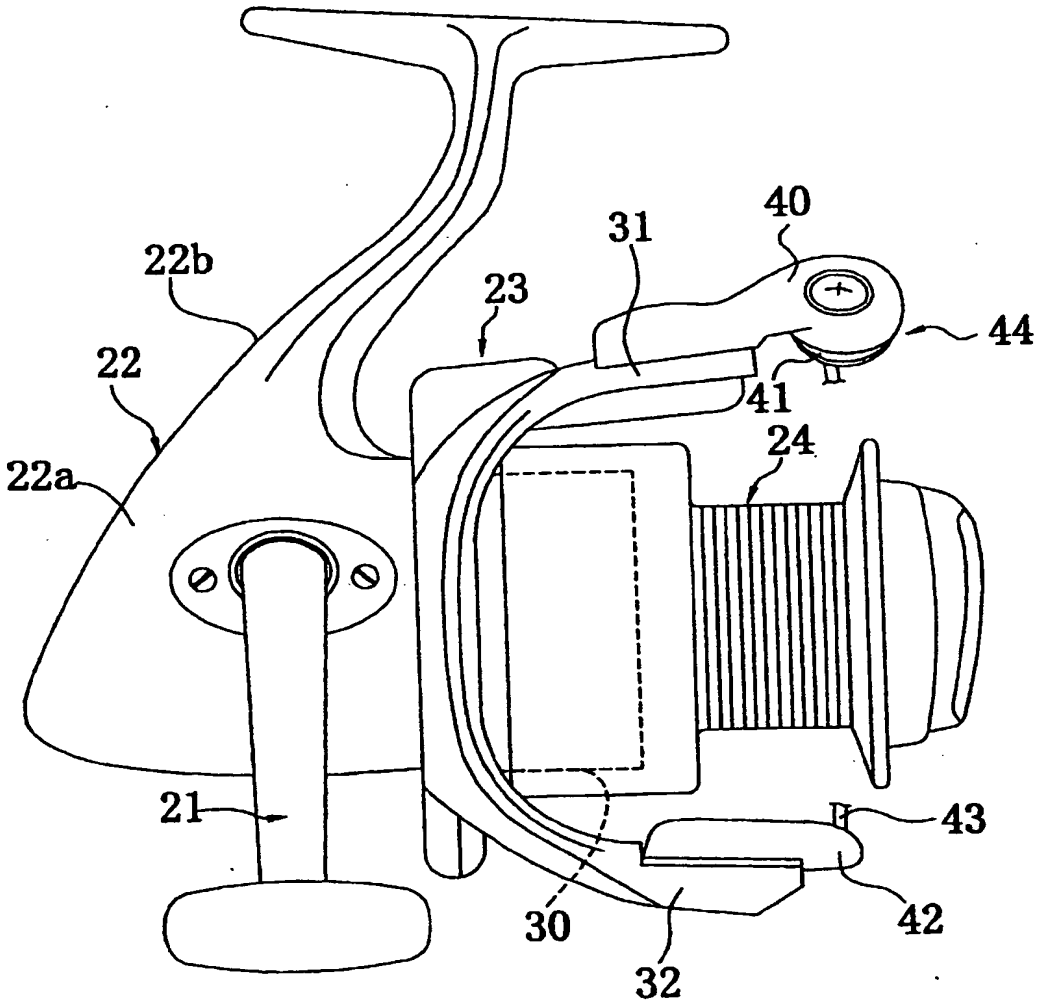

Fig. 6

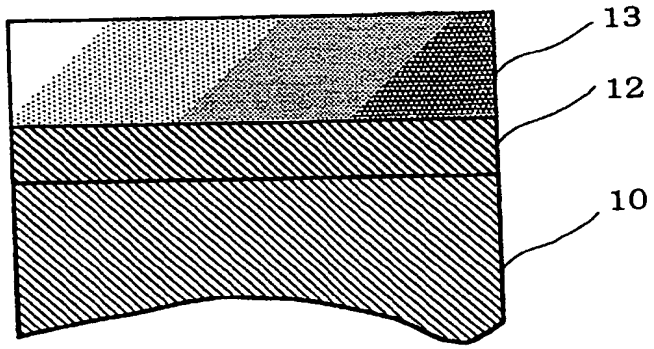

Fig. 8

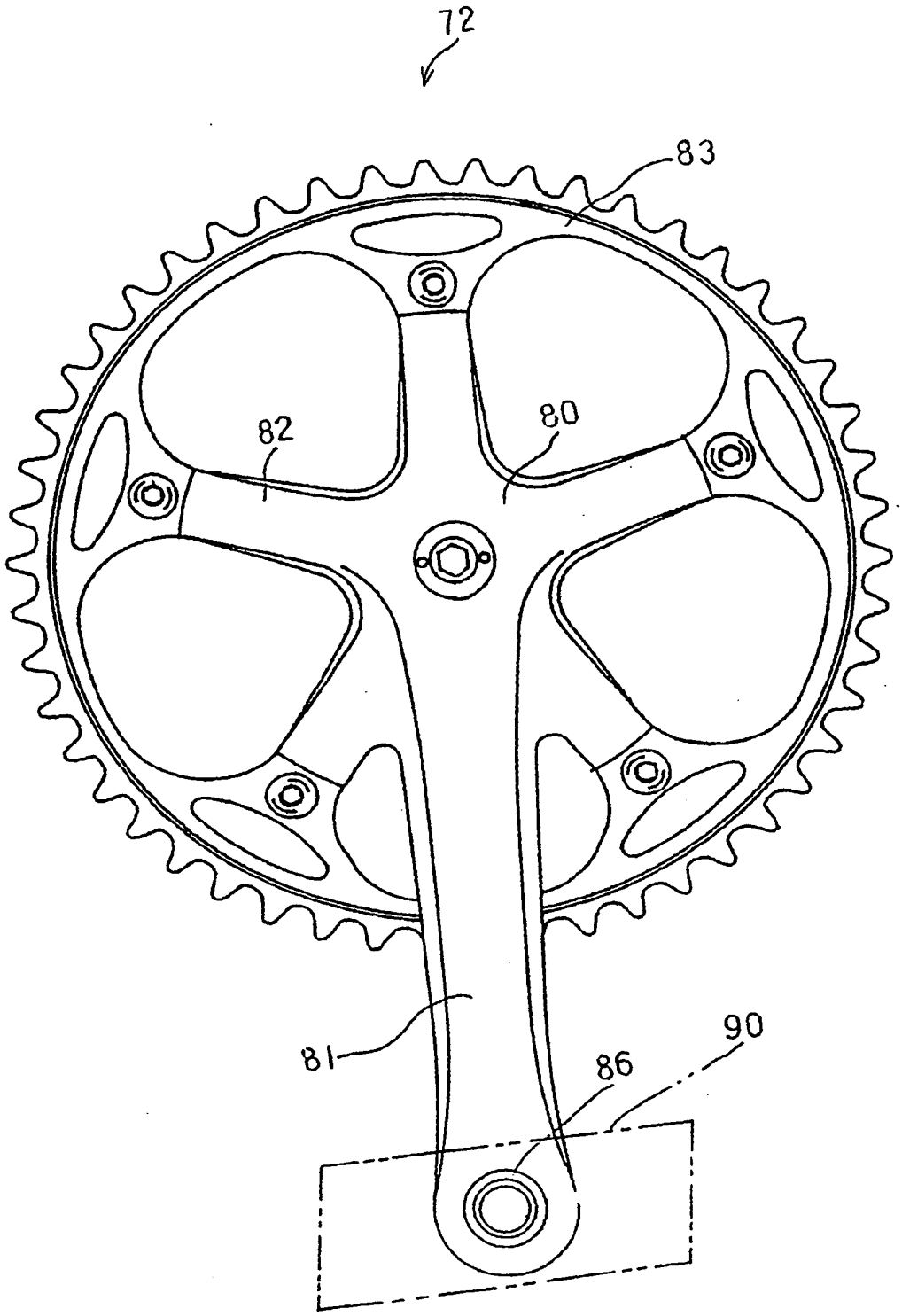

Fig. 10

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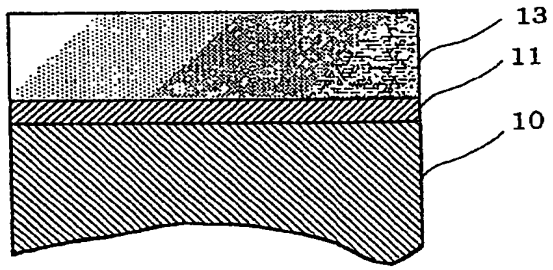

Fig. 4

EP 1 059 123 A3

European Patent Office

INCOMPLETE SEARCH SHEET C

Application Number
EP 00 30 4829

Claim(s) searched completely:
3 6-9

Claim(s) searched incompletely:
1 4 5

Claim(s) not searched:
2

Reason for the limitation of the search:

(1) Present claims 2, 4 and 5 relate to an extremely large number of possible products. Support within the meaning of Article 84 EPC and/or disclosure within the meaning of Article 83 EPC is to be found, however, for only a very small proportion of the products claimed. In the present case, the claims so lack support, and the application so lacks disclosure,
that a meaningful search over the whole of the claimed scope is impossible. Consequently, the search has been carried out for those parts of the claims which appear to be supported and disclosed, namely those parts relating to the products:

-a fishing reel and rod

-a bicycle crank

Moreover, the term "having a sliding portion" is so broad, that a meaningful search is not possible. However, the documents cited in the search report such as those describing car bodies fall into the scope of this claim.

(2) Present claim 1 relate to a product defined by reference to a desirable characteristic or property, namely "highly restorative".

The claims cover all products having this characteristic or property, whereas the application provides support within the meaning of Article 84 EPC and/or disclosure within the meaning of Article 83 EPC for only a very limited number of such products. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Independent of the above reasoning, the claims also lack clarity (Article 84 EPC). An attempt is made to define the product by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible. Consequently, the search has been carried out for those parts of the claims which appear to be clear, supported and disclosed, namely those parts relating to:

the product having an acrylic resin paint
(see description p. 3, l. 11-21)

(3) The scope of claims 6-9 was restricted accordingly to point (1) above, as claims 6-9 are dependant from claims 1, 4 and 5.

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PARTIAL EUROPEAN SEARCH REPORT

Application Number
EP 00 30 4829

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	US 5 693 710 A (KUBOTA FUMIHIKO ET AL) 2 December 1997 (1997-12-02) * column 1, line 13 - line 25 * * claim 1 *	1,3-5,8	TECHNICAL FIELDS SEARCHED (Int.Cl.7)

EPO FORM 1503 03.82 (P04C10)

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 00 30 4829

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-3 6-9

   a coated outdoor-use article

2. Claims: 4; 6-9 (partially)

   a coated article used in fishing equipement

3. Claims: 5; 6-9 (partially)

   a coated article used in bicycles

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 30 4829

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82